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Abstract

The current research examined the occurrence of threat and challenge in low and high status groups resulting from the *stability* of inter-group status differences during an inter-group competition. It was hypothesized that members of low status groups are relatively threatened when status differences are stable, but that this threat turns into a challenge when status differences become unstable. By contrast, unstable status relations were predicted to lead to threat in members of high status groups. Participants (*N* = 40) were categorized in minimal groups. Inter-group status differences, and the stability of these differences, were manipulated by providing feedback on three group tasks. During these tasks cardiovascular threat and challenge responses were measured following the *biopsychosocial model* (BPS; Blascovich & Tomaka, 1996). Results were in line with expectations and are discussed in terms of the BPS model and social identity theory.

Turning Social Identity Threat into Challenge:

Status Stability and Cardiovascular Reactivity During Inter-group Competition

In 2004, a group of researchers published a provocative prediction in *Nature*: They demonstrated that the performance curve for the 100-meter sprint is steeper for women than for men, which led them to predict that women will outrun men at the 2156 Olympics (Tatem, Guerra, Atkinson, & Hay, 2004). Although it remains to be seen of course whether this prediction will hold, I propose that such *cues* about changing inter-group status relations have important motivational implications for members of the low and the high status group in a given domain. Specifically, whereas stable inter-group status differences will pose a threat to the social identity of members of low status groups, unstable status differences will turn this threat into a challenge, and pose a threat to the social identity of members of high status groups. These predictions will be tested in the current research, were threat and challenge will be measured using the cardiovascular markers described by the *biopsychosocial model* (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996).

## Social Identity Threat

The concept of threat has always been central within the psychology of inter-group relations, and forms one of the core motivational constructs within wide range of theories in this domain (e.g., Branscombe, Ellemers, Spears, & Doosje, 1999; Cottrell & Neuberg, 2005; Sherif & Sherif, 1969; Sidanius & Pratto, 1999; Steele, Spencer, & Aronson, 2002; Stephan & Stephan; 1985; Wildschut, Insko, & Pinter, 2004; see Riek, Mania, & Gaertner, 2006 for an overview). Over the years, however, there has been a shift in focus regarding the *source* of threat: Whereas classic approaches focused on *material* forms of threat (e.g., Sherif & Sherif, 1969), more recently there has been a growing interest in *identity*-related forms of threat in inter-group contexts (Branscombe et al., 1999; Ellemers, Spears, & Doosje, 2002; Kaiser, Vick, & Major, 2006; Major & O'Brien, 2005; McCoy & Major, 2003; Schmader, 2002; Steele et al., 2002).

An important example of these identity-approaches is the social identity perspective on inter-group threat. This perspective builds upon *social identity theory*'s proposition that people derive part of their identity from the groups to which they belong (i.e., their "social identity"; Tajfel & Turner, 1979). The motivational part of the theory states that people strive for a *positive* social identity, which has been related to enhanced self-esteem (Abrams & Hogg, 1988) and decreased uncertainty (Hogg, 2000). A positive social identity is accomplished by membership in groups that are in a positive way distinctive from relevant out-groups (i.e., groups that take a relatively high position in the inter-group status hierarchy). When positive group distinctiveness is undermined (e.g., when one's group has a relatively low status) social identity threat arises.

In turn, social identity threat has been linked to a wide range of important consequences, including declined psychological and physical *wellbeing* (e.g., Cole, Kemeny, & Taylor, 1997; Major & O'Brien, 2005), undermined *performance* (Steele, 1997), *avoidance* of tasks and situations in which the group is threatened (Major, Spencer, Schmader, Wolfe, & Crocker, 1998; Steele et al., 2002), increased *discrimination* against out-groups (Branscombe & Wann, 1994), and strengthened *identification* with the in-group (Branscombe, Schmitt, & Harvey, 1999). Thus, social identity threat has become a core motivational concept within the psychology of inter-group relations, and at least some part of this interest can be attributed to its important consequences.

The current work aims to extend the existing theory and research on social identity threat in two ways: *First*, by moving beyond the concept of threat and also taking its motivational opposite, challenge, into account; *Second*, by measuring threat and challenge in relation to social identity more directly by applying the physiological measures described in the biopsychosocial

(BPS) model by Blascovich and colleagues (Blascovich & Mendes, 2000; Blascovich & Seery, 2007; Blascovich & Tomaka, 1996).

Threat and Challenge in Relation to Social Identity

Whereas threat has been conceptualized as a *maladaptive* state related to declined health and impaired performance, challenge has been conceptualized as a more *benign* state related to approach, facilitated performance, and more positive health outcomes (Dienstbier, 1989; Mendes, Major, McCoy, & Blascovich, 2008). Based on this it can be argued that challenge, like threat, is potentially an important concept for the psychology of inter-group relations. For example, when members of low status groups are challenged (rather than threatened) by their group's position, they are more likely to react with more functional coping like remaining committed to the group (Ellemers, Spears, & Doosje, 1997), increasing effort to improve the group's position (Ouwerkerk, De Gilder, & De Vries, 2000), and actively trying to disconfirm negative stereotypical expectations (Kray, Thompson, & Galinski, 2001).

The question then becomes under which conditions social identity threat and -challenge emerges. On the basis of the above-outlined rationale it can be predicted that social identity threat is most likely to arise in groups with a relatively low status, as these groups obviously lack positive distinctiveness. However, this will only be the case when the status hierarchy is relatively *stable*. When the status hierarchy becomes *unstable*, as illustrated by the opening example, the threat in members of low status groups will turn into a challenge, as status improvement seems possible. At the same time, unstable status relations will pose a threat to the social identity of members of high status groups as it becomes clear that their group's superior position is not to be taken for granted (Bettencourt, Dorr, Charlton, & Hume, 2001; Turner & Brown, 1978; see also Sidanius & Pratto, 1999).

The above line of reasoning is in line with research on stress in primates which has revealed that in stable groups the low ranked animals show the greatest stress-related physiology, whereas in unstable groups the highly-ranked animals show the greatest stress response (Sapolsky, 2005). Applying this reasoning to humans in *inter*-group contexts, Scheepers and Ellemers (2005) found that members of a low status group had higher blood pressure when *evaluating* the status quo while members of high status groups had higher blood pressure when evaluating possible *changes* in the status quo. Although an increase in blood pressure is somewhat indicative for threat (Blascovich & Mendes, 2000), it was not possible to measure challenge in this prior experiment. Therefore, challenge and threat are measured more directly in the current experiment using more advanced cardiovascular measures.

Measuring Threat and Challenge

Despite that threat has become one of the central explanatory constructs within social identity theory, the state of threat has seldom been measured more directly in relation to social identity (see Matheson & Cole, 2004 and Scheepers & Ellemers, 2005 for exceptions). The current work aims to measure the motivational states of threat and challenge more directly, continuously, and unobtrusively by applying the cardiovascular indices described in the *biopsychosocial model* (BPS) by Blascovich and colleagues (Blascovich & Mendes, 2000; Blascovich & Tomaka, 1996). This model describes specific cardiovascular markers of the states of threat and challenge during so-called *motivated performance situations* (e.g., athletic performance, doing a math test, inter-group cooperation or competition, etc.).[1]

During motivated performance, threat and challenge can be distinguished by means of specific patterns of three cardiovascular indices: *ventricular contractility* (VC; a measure of the force with which the heart pumps), *cardiac output* (CO, representing the amount of blood pumped by the heart in a single minute), and *total peripheral resistance* (TPR; a measure of the resistance of the arterioles). Challenge is marked by increased ventricular contractility (VC) in combination with lower vascular resistance (TPR) which leads to increased cardiac output (CO). Threat is marked by moderate increases in VC in combination with higher TPR leading to no changes or decreases in cardiac output. Put differently, challenge leads to relatively higher cardiac performance (VC and CO) and lower vascular resistance (TPR) than threat does, whereas threat leads to relatively lower cardiac performance and higher vascular resistance than challenge does. The physiological indices described above can be measured non-invasively by a combination of impedance cardiography (ICG), electrocardiography (EKG) and blood pressure assessments (Sherwood et al., 1990).

The BPS model has been applied to a variety of domains in social psychology (see Blascovich & Seery, 2007 for an overview), including inter-group interactions and stereotype threat (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001; Mendes, Blascovich, Hunter, Lickel, & Jost, 2007; Mendes et al., 2008; Vick, Seery, Blascovich, & Weisbuch, 2008). For example, it has been shown that inter-group interactions often elicit a threat response (Blascovich et al., 2001), especially when the out-group member violates stereotypic expectancies about group status (Mendes et al., 2007). In addition, Vick et al. (2008) showed that presenting a math-test as gender-biased led to a threat reaction in women (in line with the stereotype threat phenomenon) and a challenge reaction in men (in line with the stereotype lift phenomenon). By contrast, presenting the test as gender-fair led to challenge in women and threat in men. The current work builds on this prior work, but also moves beyond it by examining *social identity* as a source of threat and challenge. This will be sone by using a minimal group paradigm, a paradigm that is designed to isolate social identity and exclude other (more instrumental) explanatory factors in inter-group relations (Tajfel & Turner, 1979).

## The Current Research

In the current experiment, participants were categorized in minimal groups after which they engaged in three group tasks. After the first task group-level feedback was provided about the performance of the in-group relative to the out-group (group status manipulation). For the second task it was mentioned that performance on the first task was generally a good predictor for performance on the second task (creating a stable inter-group situation) whereas for the third task it was mentioned that performance on the first two tasks was only a weak predictor for performance on this third task (creating an unstable situation; see also Doosje, Spears, & Ellemers, 2002). The central predictions are that members of the low status group are relatively threatened during the stable situation[2] and challenged during the unstable situation. Conversely, members of the high status group will be more threatened during the unstable than during the stable situation. Members of the high status group were not predicted to be particularly challenged by the stable situation as their group's position is then positive and secure.

## Method

### *Participants and Design*

Participants were 40 undergraduate students (54% women, mean age = 20) at Leiden University. They received €6 (approximately $ 7.5) for their participation. Participants were randomly allocated to a 2(Group Status; Low vs. High) X 2(Status Stability; Unstable vs. Stable) design with repeated measures on the last factor.

### *Physiological Measurements*

Impedance-cardiographic signals (ICG), electrocardiographic signals (EKG), and blood pressure were continuously measured during the experiment using a Biopac MP150 system (Biopac Systems Inc., Goleta, CA). Impedance cardiography is a noninvasive technique for measuring *stroke volume* (SV) and systolic time intervals (e.g., pre-ejection period; PEP, see Sherwood et al., 1990). Stroke volume represents the amount of blood that is pumped by the heart at a given heartbeat. Multiplying SV with heart rate (which can be derived from the EKG) yields CO, i.e., the amount of blood in liters that is pumped by the heart in a single minute. Pre-ejection period is a measure of ventricular contractility (VC) and represents the interval between the start of the electromechanical systole (as indicated by the Q-point in the EKG) and the opening of the aorta valve (as indicated by the B-point in the ICG). For presentational reasons, PEP is multiplied with -1 such that higher values represent higher VC.

For measuring ICG the NICO100c module was used, together with four strip-electrodes, two of which were placed at the back of the neck, and two at the back. The two outer electrodes inject a small (400µA) alternating current while the two inner electrodes measure the voltage developed through the thorax volume. As output the NICO100c provides measures of baseline impedance ($Z_0$) and the rate of change in impedance (dZ/dt), which can be used to derive measures of cardiac performance (stroke volume, pre-ejection period; see Sherwood et al., 1990).

Electrocardiography was measured using an ECG100 module and a Lead I electrode configuration. Blood pressure was measured continually using a NIBP100A module, which is equipped with a wrist sensor, that was placed over the radial artery of the participant's non-preferred hand to measure the pulse wave from the radial pulse. Every 15 seconds a measurement was taken. The NIBP100A provides a measure of mean arterial pressure (MAP) which, in combination with CO, can be used to calculate TPR, using the following formula: TPR = (MAP/CO) X 80. Physiological data was stored and scored using *Acqknowledge* software. Stroke volume was calculated using the Kubicek formula (Sherwood et al., 1990); pre-ejection period was scored manually from ensemble-averaged EKG and ICG waveforms.

*Procedure and Independent Variables*

The whole experiment was run on computers, such that all information, tasks, and manipulations were delivered via computer. Upon arrival in the lab, the participant was seated in a cubicle, where sensors for physiological recording were applied. Then, five minutes of baseline CV responses were collected during which the participant sat quietly and relaxed.

After the baseline period, the 'real' study started. The research was said to be concerned with "modes of reasoning and problem solving ability." It was explained that prior research had revealed two kinds of reasoners: inductive and deductive. The goal of this research was said to be discovering which group had better problem solving abilities. Participants first engaged in an inductive/deductive reasoning test, which consisted of making associations between a series of concepts and a series of numbers. Participants were then given (false) feedback about their reasoning mode: All participants were categorized as inductive reasoners.

Ostensibly to be able to compare the problem solving abilities of members of the two groups, the participants then engaged in three tasks: A number-counting task, a letter-counting task, and a word-searching task. The first task (used to manipulate initial group-status differences) was the number-counting task for which the participant was required to count as quickly as possible how many times a specific number was present in a series of numbers that was shown for only two seconds on the screen (e.g., "how many times do you see a '4' in the following series: '14414114141'). There were ten such items which increased in difficulty. The accuracy of the participants' responses was said to represent the performance measure.

After the first task participants were shown a bar graph that ostensibly represented the "performance of both groups so far on the number-counting task". This was the group status manipulation. In the low status condition, participants learned that their in-group, the inductive group, had been less accurate during the number-counting task than the out-group, the deductive group. In the high status condition, participants learned that their in-group had been more accurate than the deductive group.

After the status manipulation, the second task was announced: a letter-counting task. Participants were told that because this task had roughly the same format as the number-counting task, performance on the number-counting task was a good predictor of performance on the letter-counting task. In other words, status differences were likely to remain *stable* during this task. After this information the letter-counting task commenced, which had the same format as the number-counting task, except that letters instead of words had to be counted.

After the letter-counting task, the third task was announced: a word-finding task (see e.g., Blascovich et al., 2001 for a similar task). For this task participants had to find words in a matrix of letters. Before the task started it was announced that because the word-finding task had a somewhat different format compared to the number- and letter-counting tasks, performance on the first two tasks was a poor predictor of performance on the word-finding task. In other words, status differences became *unstable* for this task. Participants were then given five minutes to find as many words as they could in the matrix. Participants typed in their responses using their dominant hand. After the word-finding task, the participants were debriefed, paid, thanked for their participation, and then dismissed.

*Dependent Variables*

The successfulness of our manipulations was checked using several items. Just after the first task (the number-counting task) and just before receiving the status feedback it was checked whether the participants were aware of their group membership. Participants responded by clicking on one of two buttons, one of which was labeled “inductive group” and the other “deductive group”. After the status manipulation a similar procedure was used to check whether the participant was aware of the status differences. In addition, status was checked with the question “Which group performed better during this study so far?” Responses to this question were made by placing crosses on a 100-point scale with *inductive group* (0) and *deductive group*

(100) as endpoints. Just before the second (i.e., the letter-counting) task the stability of the status differential was checked by means of the following item: “How big do you think is the chance that the relations between the groups concerning their performance on the letter-counting task will be similar to that on the number-counting task?” Just before the third (i.e., word-finding) task the stability of the status relations was again checked using the same item. Responses to both stability checks were given by placing crosses on 100-point scales with *not at all* (0) and *very much* (100) as endpoints.

The primary dependent measure was the cardiovascular reactivity (VC, CO, TPR) during the letter-counting (i.e., stable), and the word-finding (i.e., unstable) tasks. In addition, we also assessed the performance on the word-finding task in terms of the number of words that were found (Blascovich et al., 2001).

## Results

### *Checks*

All participants indicated their group membership in accordance with the manipulation and only one participant indicated the status of his/her group incorrectly on the dichotomous status check. The continuous status check was recoded so that higher numbers indicated higher status for the in-group. Analysis of this item revealed that participants in the high status condition ascribed higher status to their group ($M$ = 87.56, $SD$ = 08.56) than did participants in the low status condition ($M$ = 38.50, $SD$ = 09.86), $t(38) = 16.80$, $p < .001$. The two stability items were analyzed using a 2(Group Status; Low vs. High) X 2(Status Stability; Unstable vs. Stable) GLM with repeated measures on the last factor. The only effect that emerged from this analysis was a strong main effect for stability: Status stability was perceived to be greater during the stable task ($M$ = 52.30, $SD$ = 26.98) than during the unstable task ($M$ = 18.95, $SD$ = 17.92), $F(1, 38) = 30.45$, $p < .001$. In sum, the manipulations were successful.

*Cardiovascular Measures*

Mean levels of VC, CO, and TPR were calculated for the last minute of the baseline, and the first minute of each task. It was then confirmed that there were no between-condition differences on the three cardiovascular measures, $F$s < 1, *ns*. In line with standard practice (e.g., Blascovich et al., 2001) reactivity scores were then created for the three measures by subtracting the baseline scores from the mean scores during the stable situation (letter-counting task) and the unstable situation (word-finding task).

The three cardiovascular measures (VC, CO, and TPR) were analyzed using 2(Group Status; Low vs. High) X 2(Status Stability; Unstable vs. Stable) GLMs with repeated measures on the last factor. In each GLM, the corresponding physiological measure during the first task (number-counting) was used as a covariate to control for individual differences in cardiovascular reactivity during this kind of mental tasks (see Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004, for a similar procedure).[3] The interactions between group status and status stability were significant for VC, $F(1, 37) = 20.07$, $p < .001$, CO, $F(1, 37) = 4.63$, $p = .038$, and TPR, $F(1, 34) = 15.15$, $p < .001$. These interactions are displayed in Figure 1.

As can be seen in the figure, under stable conditions members of the low status group are relatively more threatened (indicated by lower cardiac performance and higher vascular resistance) and members of high status groups are relatively more challenged (indicated by higher cardiac performance and lower vascular resistance). However, under unstable conditions this effect turns around in that members of the lower status group are relatively more challenged and members of the high status group are more threatened.

A test of the simple main effects revealed that under stable conditions members of the low status group had lower VC, $F(1, 37) = 3.51$, $p = .069$, and higher TPR, $F(1, 34) = 4.62$, $p = .039$ (indicative for more threat and less challenge) than members of the high status group. Under unstable conditions, members of the low status group had higher VC, $F(1, 37) = 7.03$, $p = .012$ and lower TPR, $F(1, 34) = 7.91$, $p = .008$ (indicative for more challenge and less threat) compared to the high status group. With regard to CO there were no significant differences.

The within-participants effects revealed, in line with predictions, that members of the low status group became more challenged when the inter-group situation shifted from stable to unstable, which was indicated by significantly higher VC, $F(1, 37) = 13.76$, $p = .001$, and CO, $F(1, 37) = 13.86$, $p = .001$, and lower TPR, $F(1, 37) = 9.75$, $p = .004$, in the unstable than in the stable situation. Although participants in the high status condition had higher VC in the stable than in the unstable condition, VC, $F(1, 37) = 7.11$, $p = .011$, there were no significant effects for CO and TPR.

In sum, participants in the low status condition started relatively threatened under stable conditions, but became more challenged when the status differences became unstable. The within-subject effects in the high status condition where less strong compared to those in the low status condition. This was somewhat anticipated however as the stable situation was not expected to form a strong challenge for participants in the high status condition, making the contrast with the unstable situation less strong. However, an examination of the absolute changes in cardiovascular reactivity provides evidence for a physiological threat response for members of the high status group when the status differences were unstable but not when they were stable. That is, under unstable conditions participants in the high status condition showed a moderate increase in VC ($M = 3.44$; $t[19] = 3.35$, $p = .002$), no change in CO ($M = 0.21$; $t[19] = 1.25$, *ns*), and an increase in TPR ($M = 127.98$; $t[19] = 2.69$, $p = .014$) reflecting the classic threat pattern (Blascovich et al., 2001). In the stable high status condition CO and TPR did not differ significantly from zero, a pattern that is less easily interpretable in terms of threat or challenge, which is in line with expectations.

*Performance*

During the word-finding task (unstable situation), participants in the low status condition found more words ($M$ = 20.15, $SD$ = 4.91) than did participants in the high status condition ($M$ = 16.90, $SD$ = 4.33), $t(38) = 2.20$, $p = .032$. Performance was not significantly correlated with cardiovascular reactivity.

## Discussion

The results of the experiment were generally in line with expectations. Members of the low status group started relatively threatened when the status hierarchy was stable, but this threat turned into a challenge when status differences became unstable. In addition, participants in the high status condition displayed a physiological threat pattern when the status differences were unstable, but not when they were stable. The implications of these results for social identity theory and the BPS-model will be discussed after discussing some limitations of the current experiment.

*Limitations*

During word-searching task (i.e., the unstable situation), members of the low status group did not only display a challenge response, they also outperformed the high status group. However, there was no relationship between cardiovascular reactivity (‘challenge’) and performance. Although the challenge response is typically accompanied by facilitated performance (Blascovich et al., 2001; Mendes et al., 2007), the absence of a relationship between the two is not necessarily at odd with the BPS model. That is, the cardiovascular responses described within the model are *markers* of challenge and threat motivational states which do not necessarily have to be directly related to other outcomes of these states (Blascovich, Mendes, Hunter, & Salomon, 1999; Mendes, et al., 2008). In the light of other evidence that members of low status groups show increased effort when status is unstable (Ouwerkerk & Ellemers, 2002) it is likely that differences in effort also explain the performance effect in the current situation.

A limitation of the current research design is that the stability factor was not counterbalanced. That is, the stable situation always preceded the unstable situation. It seems plausible however that the high status group would have shown a stronger challenge response during the stable situation when it had followed the unstable situation, in order to reinstate its position within the status hierarchy. This is something that could be tested in future research.

*Implications for the Motivational Basis of Social Identity Theory*

The current work has at least three implications for the social identity perspective. First, whereas prior work has mainly focused on the *outcomes* of the pursuit for a positive social identity (e.g., self-esteem, certainty; Abrams & Hogg, 1988; Hogg, 2000), the current work has examined the *motivational processes* leading to this goal (see also Sassenberg, Jonas, Shah, & Brazy, 2007). A second implication concerns the introduction of the *challenge*-concept to the social identity perspective. This is important because some of the variables within social identity theory that have been related to threat (e.g., identification, commitment, in-group favoritism) might actually be better explained in terms of challenge. A final implication concerns the demonstration of the usefulness of physiological measures to address social identity phenomena (see also Matheson & Cole, 2004; Scheepers & Ellemers, 2005).

*Implications for the BPS Model*

The current work also adds to the list of domains of social psychology that have benefited from a threat/challenge analysis (Blascovich & Seery, 2007). Although the BPS model has been used before to study threat and challenge in relation to inter-group relations (Blascovich et al., 2001; Mendes et al., 2007; 2008) the current research provides the most direct evidence for the role of social identity in this. A core criterion of motivated performance situations is that they are *self-evaluative*, in that performance has implications for well-being (e.g., self-esteem; Blascovich & Mendes, 2000). In prior work on the BPS model the basis for self-evaluation was often at the personal level (i.e., personal identity). By using a minimal group paradigm in the current experiment, we were able to isolate social identity as the main level of self-definition. In sum, the current research extends the literature on the BPS model in which the individual self has been central as a basis for self-evaluation.

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Endnotes

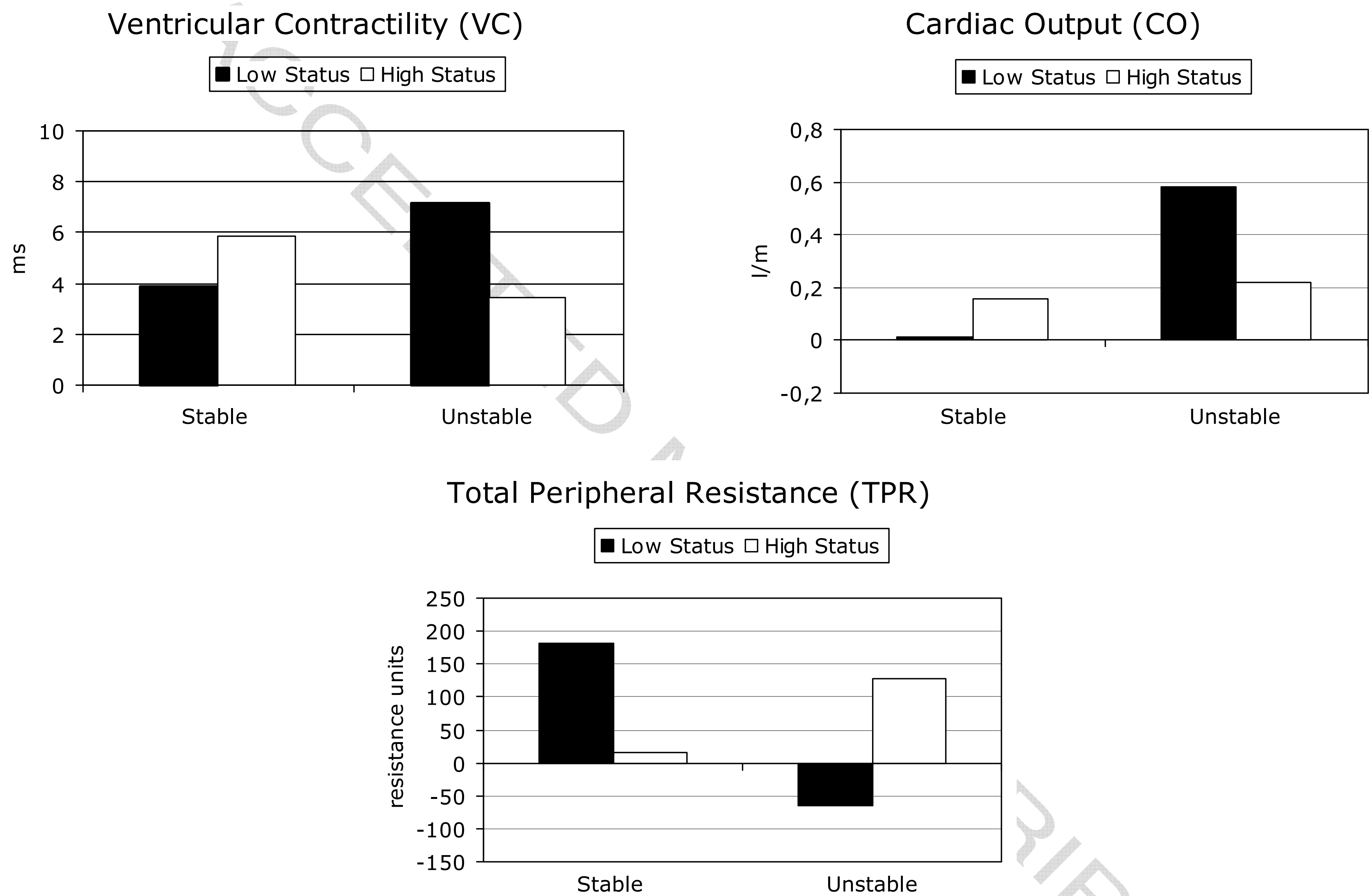
[1] For the appraisal-component of the BPS model and its neuroendocrine basis see Blascovich and Tomaka (1996), and Blascovich and Mendes (2000).

[2] On the basis of system justification theory (Jost, Banaji, & Nosek, 2004) it can be predicted that members of (stable) low status groups will tend to justify (and hence not feel threatened by) the status quo. In line with this we indeed found that members of the low status group acknowledged their group's inferior position on the status check. However, it has been shown to be still rather threatening when one's *own performance* is evaluated in the light of such low group status (Steele, 1997).

[3] The covariates were significant for all three cardiovascular measures, $F$s > 29.98, $p$s < .001. Without the covariate, the interactions remained significant for all three physiological measures: $F(1, 38) = 20.33$, $p < .001$ for VC, $F(1, 38) = 6.26$, $p = .017$ for CO, and $F(1, 38) = 10.69$, $p = .002$ for TPR respectively.

Figure Caption

*Figure 1.* Ventricular contractility (VC), cardiac output (CO), and total peripheral resistance (TPR) as a function of group status and status stability.


Ventricular Contractility (VC)
Low Status
High Status
ms
10
8
6
4
2
0
Stable
Unstable
Cardiac Output (CO)
Low Status
High Status
l/m
0,8
0,6
0,4
0,2
0
-0,2
Stable
Unstable
Total Peripheral Resistance (TPR)
Low Status
High Status
resistance units
250
200
150
100
50
0
-50
-100
-150
Stable
Unstable

*